

REMARKS

Claim Rejections

Claim Rejections – 35 U.S.C. § 112

Claim 3 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out distinctively claim the subject matter. To the extent the rejection applies to the amended claim, applicants respectfully traverse the rejection. Applicants have amended claim 3 to no longer be indefinite.

Claim Rejections – 35 U.S.C. § 102

Claims 1, 9, and 12 were rejected under 35 USC § 102(b) as being anticipated by Fernandes (US Patent 3,590,558).

As the Examiner stated in the Office Action, Fernandes teaches a swirl separator (10) with a tubular housing (24) and axial inlet (46) with a swirl imparting means (44), a solid outlet opening (68), a co-axial gas outlet conduit (32) and bulb (74).

Fernandes does not teach or suggest the desirability of the solids outlet opening comprising an annular opening about a vortex extender pin as taught in applicants' Claim 1. The opening in Fernandes (68) is a very small hole provided in the bottom (54) of the tubular housing (24). This opening (68) will lead to the solids remaining at the bottom (54) and being reentrained in the vortex. In contrast an annular opening as taught in applicants' Claim 1 will allow improved solid separation from a gas.

Dependent Claims 9 and 12 are allowable for at least the same reasons as independent Claim 1, discussed above, from which they depend.

Claim rejection 35 USC § 103

Claims 2-4 were rejected under 35 USC § 103(a) as being unpatentable over Fernandes as applied to Claim 1 above, and further in view of Cordes (US Patent 3,675,401). To the extent the rejection applies to the amended claims, applicants respectfully traverse the rejection.

Cordes teaches a device with a tangential inlet (11) which operates with a lower separation efficiency than a swirl tube with vanes as taught in applicants' Claim 1 and in Fernandes. Applicants respectfully submit that there is no motivation of suggestion to combine the teachings of Fernandes and Cordes as taught by the Examiner.

In addition, Cordes teaches a rod 19 which is used to hold baffles 21 near the solids outlet. These baffles 21 will serve to break the vortex in the chamber and lower separation efficiency. The baffles will collide with the particles and the gas, and the fluid will lose momentum and stop swirling.

Lastly, Cordes does not remedy the defects of Fernandes discussed above.

Claims 5 and 6 were rejected under 35 USC § 103(a) in view of Fernandes and Cordes. Claims 5-6 are allowable for at least the same reasons as Claims 2-4 discussed above.

Claims 7-8 were rejected under 35 USC § 103(a) as being unpatentable over Fernandes in view of Barnes (US Patent 5,690,709). Applicants respectfully submit that Barnes does not remedy the defects of Fernandes discussed above regarding Claim 1. In addition applicants' respectfully submit that there is no teaching or suggestion to combine Fernandes with Barnes as taught by the Examiner.

Claims 10 and 11 were rejected under 35 USC § 103(a) as being unpatentable over Fernandes in view of Cordes. Applicants respectfully submit that Claims 10 and 11 are allowable for at least the same reasons as Claims 5-6 discussed above.

Claims 13-15 were rejected under USC § 103(a) as being unpatentable over Fernandes in view of Cordes. Applicants respectfully submit that Claims 13-15 are allowable for at least the same reasons as Claims 5 and 6 discussed above.

Conclusion

It is respectfully submitted that the above amendments and remarks are sufficient to overcome the Examiner's objections and rejections. Early allowance of this application is therefore respectfully requested.

Respectfully submitted,
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